UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/678,544	10/04/2000	Seiichi Tenpaku	FUR0011-US	6515

28970 7590 07/09/2004

SHAW PITTMAN
IP GROUP
1650 TYSONS BOULEVARD
SUITE 1300
MCLEAN, VA 22102

EXAMINER	
LERNER, MARTIN	
ART UNIT	**PAPER NUMBER**
2654	

DATE MAILED: 07/09/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/678,544	TENPAKU ET AL.	
	Examiner	Art Unit	
	Martin Lerner	2654	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *08 June 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 to 18* is/are pending in the application.

4a) Of the above claim(s) *12 to 15* is/are withdrawn from consideration.

5)☒ Claim(s) *1, 3, 4, and 6 to 9* is/are allowed.

6)☒ Claim(s) *2, 5, 10, 11, and 16 to 18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☒ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *04 October 2000* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *5*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Election/Restrictions

1. Applicants' election with traverse of Group I, Claims 1 to 11 and 16 to 18, in the reply filed on 08 June 2004 is acknowledged. The traversal is on the grounds that that subject matter of all of claims 1 to 18 is sufficiently related that a complete search for the subject matter of the elected claims would necessarily encompass a complete search for the subject matter of the non-elected claims. This is not found persuasive because there is a clear line of distinction in subject matter between the elected claims and the non-elected claims. Group I contains claims directed to subject matter of modifying a speech waveform as it converges on a minus peak. Group II contains claims directed to subject matter of modifying a speech waveform with arrow keys. There are no claims that link the two inventions in any significant way. Clearly, an art recognized divergence for subject matter is present between the two inventions, and a separate search is required for each of the two inventions due to their different classifications. Accordingly, restriction is proper.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 12 to 15 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected invention, there being no allowable generic or linking claim. Applicants timely traversed the restriction (election) requirement in the reply filed on 08 June 2004.

Drawings

3. The drawings are objected to because of the following minor errors:

4. In Figure 5, Step S4, "determinig" should be –determining—

In Figure 7, Step S27, "ponting" should be –pointing—.

Corrected drawing sheets are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheets should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, Applicants will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

Specification

5. The disclosure is objected to because of the following informalities:

On page 2, line 9, "fundeamental" should be –fundamental—

On page 15, line 11, "stepS7" should be –step S7—.

On page 22, line 24 to page 24, line 22, there are repeated references to the claims, all of which should be deleted. The final numbering of the claims generally does not reflect the numbering of the claims as filed. Thus, any reference in a specification to the claims is inappropriate as likely to be inaccurate.

Appropriate correction is required.

Claim Objections

6. Claim 17 is objected to because of the following informalities:

In claim 17, line 2, "and lengthened and lengthened" is redundant. Appropriate correction is required.

Claim Rejections - 35 USC § 102

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 2, 5, 11, and 16 to 18 are rejected under 35 U.S.C. 102(e) as being anticipated by *Cooper et al.*

Regarding independent claim 2, *Cooper et al.* discloses a frequency converter method, comprising:

"processing a segment of a waveform in which the waveform is converging on a minus peak during a periodical unit of speech waveform data, upon receiving the speech waveform data requiring pitch conversion" – signal modification circuit 50 adds or subtracts samples from an input signal 10 to perform pitch modification or pitch correction (column 8, lines 15 to 36: Figures 3 to 15); three insertion points were examined: peaks, zero crossing, and 30 degree lagging from zero crossing; a feature of the positive and negative peaks of a sine wave is that they are the location of minimum slope, or minimum first difference magnitude; insertion at the peaks gave lower distortion (column 8, line 57 to column 9, line 9: Figures 3 to 15); sample insertion or sample deletion at a negative peak is equivalent to "processing a segment of a waveform in which the waveform is converging on a minus peak"; an object is to allow real time frequency shifting of a input signal, for example, a human voice ("speech waveform data") (column 2, lines 56 to 59); Figures 3 to 15 show "a periodical unit" of waveforms, e.g. one sine wave period.

Regarding independent claim 5, *Cooper et al.* discloses a frequency converter system, comprising:

"wherein the several sample speech waveform data are prepared by modifying a contour of a waveform in a segment in which the waveform is converging on a minus peak during a periodical unit of speech waveform data" – signal modification circuit 50

adds or subtracts samples from an input signal 10 to perform pitch modification or pitch correction (column 8, lines 15 to 36: Figures 3 to 15); Figures 3 to 15 show "a periodical unit" of waveforms, e.g. one sine wave period; adding or deleting samples from a waveform necessarily involves "modifying a contour of a waveform"; three insertion points were examined: peaks, zero crossing, and 30 degree lagging from zero crossing; a feature of the positive and negative peaks of a sine wave is that they are the location of minimum slope, or minimum first difference magnitude; insertion at the peaks gave lower distortion (column 8, line 57 to column 9, line 9: Figures 3 to 15); sample insertion or sample deletion at a negative peak is equivalent to "modifying a contour of waveform in a segment in which the waveform is converging on a minus peak"; an object is to allow real time frequency shifting of a input signal, for example, a human voice ("speech waveform data") (column 2, lines 56 to 59); implicitly, each of a plurality of sampled waveforms of various pitch lengths are modified in the manner disclosed.

Regarding independent claim 11, *Cooper et al.* discloses a frequency converter method, comprising:

"performing pitch conversion by processing waveform in a segment in which the waveform is converging on a minus peak during a periodical unit of speech waveforms" – signal modification circuit 50 adds or subtracts samples from an input signal 10 to perform pitch modification or pitch correction (column 8, lines 15 to 36: Figures 3 to 15); three insertion points were examined: peaks, zero crossing, and 30 degree lagging from zero crossing; a feature of the positive and negative peaks of a sine wave is that they

are the location of minimum slope, or minimum first difference magnitude; insertion at the peaks gave lower distortion (column 8, line 57 to column 9, line 9: Figures 3 to 15); sample insertion or sample deletion at a negative peak is equivalent to "processing a waveform in a segment in which the waveform is converging on a minus peak"; an object is to allow real time frequency shifting of a input signal, for example, a human voice ("speech waveforms") (column 2, lines 56 to 59); Figures 3 to 15 show "a periodical unit" of waveforms, e.g. one sine wave period.

Regarding claims 16 and 18, *Cooper et al.* discloses three insertion points were examined: peaks, zero crossing, and 30 degree lagging from zero crossing; a feature of the positive and negative peaks of a sine wave is that they are the location of minimum slope, or minimum first difference magnitude; insertion at the peaks gave lower distortion (column 8, line 57 to column 9, line 9: Figures 3 to 15); thus, insertion at a zero crossing point corresponds to assigning "a larger processing value at around a zero crossing point and a smaller value is provided at a point farther from the zero crossing point"; insertion at zero crossing points corresponding to both positive and negative peaks is disclosed, so insertion at a zero crossing point associated with a negative peak corresponds to "waveform processing at around a zero crossing point is performed within the segment in which the waveform is converging on the minus peak".

Regarding claim 17, *Cooper et al.* discloses signal modification circuit 50 adds or subtracts samples from an input signal 10 to perform pitch modification or pitch correction (column 8, lines 15 to 36: Figures 3 to 15); adding or subtracting samples for

pitch modification corresponds to "wherein the pitch is one of shortened and lengthened and lengthened by one of compressing and extending, respectively, the waveform along a time axis".

Claim Rejections - 35 USC § 103

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

10. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over *Cooper et al.* in view of *Asano*.

Cooper et al. discloses a method of pitch modification of a speech waveform as the waveform is converging on peaks and zero crossings by storing samples in RAM memories during processing. (Column 9, Lines 16 to 65: Figure 16). Thus, *Cooper et al.* provides "a sample waveform data storing area storing sample waveform data of human speech utterances in a speech unit" and "an indicating information storage area that stores information to provide a last zero crossing before a minus peak in the sample waveform data." However, *Cooper et al.* omits "a phonetic information storing area storing the phonetic information associated with the sample waveform data in the speech unit." *Asano* teaches a speech synthesis, or text-to-voice audio output, for changing a fundamental frequency and speech rate to generate a natural and understandable tone. (Column 3, Lines 11 to 20; Column 4, Lines 41 to 56)

Specifically, *Asano* stores sample waveform data of human speech utterances in voice unit storage section 5, and a phonetic information storing area storing the phonetic information associated with the sample waveform data in dictionary 9, so that morpheme analyzing section 10 and phonetic symbol generation section 11 provide an association between a phonetic unit and a speech waveform. (Column 4, Lines 12 to 25: Figure 3) It would have been obvious to one having ordinary skill in the art to apply a pitch modification method as taught by *Cooper et al.* to a method for changing a fundamental frequency and speech rate of phonetic units as taught by *Asano* for the purpose of generating a natural and understandable tone in speech synthesis.

Allowable Subject Matter

11. Claims 1, 3, 4, and 6 to 9 are allowed.

Conclusion

12. The prior art made of record and not relied upon is considered pertinent to Applicants' disclosure.

Fukami et al., Furuhashi et al., Nishimura, Iijima et al., Kutaragi et al., and Nishiguchi et al. disclose related art.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Martin Lerner whose telephone number is (703) 308-9064. The examiner can normally be reached on 8:30 AM to 6:00 PM Monday to Thursday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (703) 305-9645. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

ML
6/23/04

Martin Lerner
Examiner
Group Art Unit 2654